

**Maintaining and reintroducing referents in French:
cognitive constraints and development of narrative skills**

Monique Vion and Annie Colas*

CREPCO, CNRS-UMR 6561
U.F.R. "Psychologie, Sciences de l'Education"
Université de Provence
29 avenue Robert-Schuman
F-13621 Aix-en-Provence cedex 1

* We would like to thank Delphine Baigue and Aïcha Idriss-Abdalla (graduate students) for their help in preparing the materials and collecting the data, and the superintendents, teachers, and staff of the Château Double, Henri Wallon, Les Granettes, Luynes, and St François d'Assise elementary schools in Aix-en-Provence and Luynes, France, for welcoming us in their classrooms.

Abstract

Seven- to eleven-year-old French-speaking children and adults told "silent" comic strip stories that differed by the frame display mode, the explicitness of the links between depicted events, and whether the topic changed on the last frame. The results showed that (a) the character in the last frame was usually referred to as a given, with a definite pronoun when the topic was maintained and a definite noun phrase or a left dislocation when the topic changed; (b) joint display of frames triggered more pronouns and left dislocations, while single-frame display led to more definite noun phrases; and (c) explicit links gave rise to more pronouns. The production conditions manipulated turned out to be a good means of assessing speakers' acquisition of within-discourse referencing expressions and narrative skills: the children gradually refined and adjusted their use of definite expressions and pronouns, whereas the adults more readily used narration-specific devices.

Key words: oral communication, reference cohesion, narratives, language development, school-age children, adulthood.

During language acquisition, children learn to build relevant and coherent messages to communicate effectively with their interlocutors. To do so, they learn to take the perspective of the audience and adjust messages accordingly. And they learn how to use cohesive devices to mark the interrelations between the various statements in their discourse. In particular, they learn to use linguistic markers to establish links between information that is already stated or available to the addressee (given) and information that is new.

The given/new opposition is a universal principle in the organization of discourse. Although the ways of expressing this opposition vary across languages (Ariel, 1988), cross-language comparisons have pointed out a number of systematic links between the cognitive status (given/new) of what the speaker is talking about and the corresponding linguistic forms in the referential system (Gundel Herberg & Zakarski, 1993). For example, indefinite articles are used to introduce a brand new referent, pronouns are used to refer to an already activated referent, and definite articles always point to a unique, identifiable referent. Forms that signal high referent accessibility (when the addressee's attention is focused on the corresponding item) are phonetically minimal (unstressed pronouns, clitics, zero anaphoras) and offer little semantic information for identifying the referent. Each time a previously-mentioned referent is referred to again, the speaker chooses among the range of expressions offered by the language to mark its new accessibility level. This establishes referential identity relations (coreferences) among the linguistic expressions used in the discourse.

Studies exploring the use of referential markers have sometimes obtained inconsistent results (Hickmann, 1984). Two types of utterance situations should be distinguished, ones involving the physical co-presence of referents and ones involving their linguistic co-presence (Clark & Carlson, 1981). When referents are physically co-present, they can be perceived by both the speaker and the listener; when they are linguistically co-present, knowledge of the referents only becomes shared as the conversation progresses.

According to early developmental research, referential markers are acquired at a young age (between 2;6 and 3 years). However, this conclusion is only true for utterance situations characterized by physical co-presence, where referential markers fulfill a deictic function: they point to the co-present referents. Their production appears to be solely stimulus-driven (Karmiloff-Smith, 1985). More recent research has shown that when no knowledge is initially shared by the interlocutors and only

linguistic co-presence can be used to achieve a state of shared knowledge, mastery of the referential system is not acquired until much later (Hickmann, 1995; Lloyd, Camaioni, & Ercolani, 1995). Not until age of 7 children are capable of handling referents in accordance with what was said earlier. In 7-year-olds productions, referential expressions are used as within-discourse cohesion devices. Children begin to interconnect different kinds of statements from culturally predefined discourse categories. Reference cohesion has been studied in a narrative discourse framework (oral or written), no doubt due to the importance of narration in educational settings. Significant strides in narrative development are known to occur during the elementary school years (Botvin & Sutton-Smith, 1977). At this age, children's choice of referential expressions seems to be strictly dictated by their desire to produce coherent discourse. They establish their own constraint of defining a main character, and then build their discourse around that character by using it as the topic of the rest of the statements they make (Karmiloff-Smith, 1981). Later, the choice of referential expressions starts to be governed by coherence constraints that apply to the discourse as a whole (its causal and temporal structure). At this point, referential expressions are less rigidly constrained (Hickmann, 1995; Hickmann, Kail, & Roland, 1995; Karmiloff-Smith, 1985; Orsolini, Rossi, & Pontecorvo, 1996; Ricard & Snow, 1990; Roth, Spekman, & Fye, 1995; Sauvaire & Vion, 1989; Vion & Colas, 1998; Vonk, Hustinx, & Simons, 1992). During adulthood, ambiguous references reappear and increase with age: new referents are often treated as givens when they have not yet been introduced, and anaphoric narration devices (whose role is to mark coreference) may not point unambiguously to a single antecedent (Light, Capps, Singh, & Alberton-Owens, 1994).

Studies using pictorial material have played an important role in research on the development of narrative discourse (Bamberg, 1987; Berman & Slobin, 1994; Fine, 1985; Norris & Bruning, 1988; Roth & Spekman, 1989). Picture-based verbalization tasks are known to be more demanding for the speaker than ones where spontaneous or simply elicited productions are collected (Peterson, 1993; Roth, Spekman, & Fye, 1995). However the cognitive mechanisms involved in the processing of pictorial materials are still poorly understood (Deutsch, 1975; McGann, & Schwartz, 1988; Schwartz, 1995) and have been examined infrequently.

Some authors have stressed the importance of inference making in story telling from comic strips (Trabasso & Nickels, 1992; Trabasso & Rodkin, 1994; Trabasso, Stein, Rodkin, Munger, & Baugh, 1992). In

picture-based narration, the speaker must not only understand the events depicted in each picture but also how pictures are connected. This requires (1) inferring the meaning of each picture, (2) building a representation of the story as a whole by establishing causal relations between the events in each picture and defining the temporal relationships between them, whether local (between two consecutive pictures) or global (over all pictures), and (3) encoding the interpretation of the meaning in a narrative format that involves at least one actor and forms a whole, with a beginning, a middle, and an end.

Other authors studying child (Danset-Léger, 1978) or adult (Canoz & Vion, 1994) speakers have looked at the effect of picture display mode on the establishment of referential links. The sequence of pictures in a story can be presented simultaneously or successively. In the latter case, cross-checking and backtracking, which help the reader interpret the meaning, are not possible. To date, developmental research has not dealt with the potential role played by pictorial material processing in marking reference cohesion. The present study was conducted for two purposes: (1) to assess the impact of cognitive activities (mnemonic and/or inferential) on the establishment of referential links and on the expression of referent accessibility, and (2) to compare the use of referential markers at two times during the acquisition of referential and narrative competence. It was hypothesized that (1) for all speakers, the use of referential expressions depends on a set of conceptual constraints that form the "context" of discourse production (Bronckart, 1985; Vion, 1995), and that (2) these constraints can be more or less conducive to the mobilization of speaker competence, whether in the process of being acquired or already well in place. It was expected that experimental control of the discourse production context would give us a more precise idea of whether or not and to what extent the verbal production process is controlled by the overall coherence of the discourse structure.

The present study is part of a larger research project designed to investigate how speakers introduce, maintain, and reintroduce referents. The cognitive constraints mentioned above were operationalized to better determine what part of reference cohesion marking is guided by the cognitive processing of the stimulus and what part is guided by the discourse structure. The study was conducted with children and adults who were native speakers of French. The availability of the information to relate and the internal coherence of pictorial materials were manipulated. Each speaker was asked to tell the story depicted in comic strips to a same-age peer who was unfamiliar with the story. The pictures contained

no text. The speakers were instructed to relate the content of each picture as accurately as possible while avoiding too many details.

The analysis presented here concerns the linguistic marking obtained for the character shown in the last frame of each comic strip. This character was always a "given" but its presence in the last picture either maintained thematic continuity or introduced a discontinuity. Depending on the case, mentioning this character required simply maintaining the reference or reintroducing it. It was expected that the experimental manipulation of the production context, which changed the degree of character accessibility, would lead to differences in the choice of referential expressions. Firstly, simultaneous availability of all events, and explicit links between them, were the two factors expected to provide a strong stimulus-driven support that would favor the mnemonic and/or inference-making processes necessary for accomplishing the task; these two constituents of the production context should promote accurate within-discourse use of referential expressions. Secondly, step-by-step exposure to information as the story unfolded, and implicit links between events, were expected to provide evidence of the lability or stability of the within-discourse use of the referential system at each age.

Method

Subjects

Two hundred and fifty-six native French-speaking subjects (118 males and 138 females) participated in the study. There were 64 seven-year-old children (first graders, median age: 6;6), 64 nine-year-old children (third graders, median age: 8;8), 64 eleven-year-old children (fifth graders, median age: 10;6) and 64 young adults (students at the University of Provence in Aix-en-Provence, France).

Materials

Each comic strip contained eight frames (8×8 cm). The first frame showed two characters. All subsequent frames showed only one of the two characters carrying out various activities. A minimal link between the frames was the continuous presence of one of the characters from the first frame.

Four different comic strip versions were constructed with the two characters by taking all combinations of two factors, each with two categories. The first factor concerned the topic of the comic strip, which either remained the same or changed. In the *maintained topic condition*, the materials were designed in such a way that a topic would be induced, after the first frame, by the repeated presence of the same character in every picture, up to and including the last one. In the *changed topic condition*, the materials were designed in such a way that a thematic break was generated by the reintroduction in the last picture of the other character. That is frame 1 had both characters, frames 2-7 showed only one character, and frame 8 showed only the other. The second factor was used to control the layout of the characters in the frames. To avoid a potential bias in referent marking brought about by the greater salience of one of the characters due to its location in the picture, the layout (left, right) of the characters in the first frame was counterbalanced.

To study the question of the constraints imposed by inferences based on visual information, a third factor was manipulated, event linkage. In the *implicit link condition*, the events in each comic strip, although presented as a sequence, could have occurred in any order (Figure 1a). It was thus the speaker's task to infer a link between the pictures. In the *explicit link condition*, the link between the frames was fixed, i.e., the order of the events could not be changed (Figure 1b).



Fig.1a. Event linkage (implicit link condition).



Fig. 1b . Event linkage (Explicit link condition).

To study the question of the constraints imposed by the display on referent accessibility, the last factor manipulated was the frame display mode. In the *simultaneous display mode*, the speaker saw all events in the story at once, because the pictures were all on the same page. Subjects were asked to look at the comic strip and prepare to tell the story immediately afterwards. In the *consecutive display mode*, the comic strip was presented in booklet format, with one picture per page. Subjects were instructed to turn the pages one by one and to tell what was happening on each page.

For each type of link, there were 32 test comic strips (8 pairs of characters x 4 versions, designed to reduce any potential effects of thematic heterogeneity), and three filler comic strips containing only one character. The fillers also had eight frames (see list of materials in Appendix).

Design

Each subject was tested on one frame display mode and on one type of link. During testing, a given subject saw eight test comic strips (i.e. 8 different pairs of characters, each presented in one of the four versions of a comic strip) and three fillers (interspersed between two test comic strips). Given that, by construction, there were twice as many character pairs as versions, a subject saw a given version twice, with a different character set in each.

The design required setting up four subgroups per age, making for a total of 16 subgroups of 16 subjects each. For a given subgroup (four subjects), the comic strip presentation order was determined by random drawing.

Procedure

Testing was individual and lasted approximately 20 minutes. Present during testing were the subject (the speaker), the experimenter, and the listener. The listener was a same-age peer from the speaker's grade in school. He or she only acted as the listener once during the experiment.

In simultaneous display, the speaker was given the following instructions: "I'm going to show you some comic strip stories. You'll see that there are no words in them, just pictures. Your task will be to tell the stories to your partner, who can't see them. Be careful to talk about every picture, without forgetting any. Tell them in the following order (the experimenter pointed to the pictures in the normal reading order). You may study the pictures as long as you want before beginning." Then the first practice comic strip was presented to the speaker, who studied it and kept it in sight until he/she had finished telling the story. The practice story was taken away and the remaining comic strips were proposed one by one.

In consecutive display, part of the above instructions were modified as follows: "I'm going to present some stories in booklets (the experimenter showed a booklet). (...) You'll be asked to say what's happening in each picture, without forgetting any. Be careful to talk about every picture, one after the other and not to go back over them." Then the first practice booklet was presented to the speaker. Between each comic strip, the experimenter reminded the subject to work picture by picture, and not to backtrack.

In all conditions listeners were to be attentive and listen carefully to the stories in order to understand them, but they were not supposed to talk.

Predictions

The predictions presented below pertain to the way the speakers were expected to refer to the character depicted in the last frame.

Predictions about the manipulated factors

Indefinite noun phrases in French, i.e. "un N" (a_{masculine} N) and "une N" (a_{feminine} N), are used to mark brand new information. Given the construction of the material (i.e. the character in frame 8 was never totally new), indefinite noun phrases should not be used. Indefinite noun phrases would be expected when (1) the topic changes, and (2) the events are presented consecutively. In both cases, the previous givenness of the referent weakens with time, so it may be reintroduced as new. The use of indefinite articles is also likely to be promoted by implicit links between events.

Definite noun phrases, i.e. "le N" (the_{masculine} N) and "la N" (the_{feminine} N) are used specifically to mark previously mentioned referents, and therefore were expected in all situations. Because their role is precisely to reintroduce referents, their chances of occurring should increase, as above, when (1) the topic changes, (2) events are presented consecutively, and (3) events are linked implicitly.

Third-person definite pronouns, i.e. "il" (subject he or it), "elle" (subject she or it), "le" (object him or it), and "la" (object her or it), which mark a high degree of referent accessibility in memory, should only be employed when the topic is maintained. Their chances of occurring should increase in simultaneous display and explicit linkage.

Zero anaphoras, as in : "the lady got the broom and the dustpan then (Z) threw it away in the waste basket all the dust then (Z) got the pail and (Z) washed the floor" which mark very high referent accessibility, should also only be used when the topic is maintained. As with pronouns, their chances of being employed should be greater when comic strip display is simultaneous and when events are linked explicitly.

Predictions about development

Within-discourse marking of referents are just becoming established during the early and middle elementary school years.. At these ages, children can be expected to get better at using referential markers as they gradually improve their narrative skills. For example, although the use of a definite noun phrase to mark topic continuity is authorized, this device should be receding to the benefit of pronouns and/or zero anaphoras. Such forms should begin to "take root" in their role as markers of a high degree of referent accessibility as soon as their use is constrained by overall discourse coherence. In the course of this gradual refinement process, some of the production conditions offered here

should temporarily provide "favorable contexts" for the emergence of more accurate ways of marking reference.

Results

The 2048 narrations recorded were transcribed in their entirety using the conventions developed by Hickmann, Liang, Hendricks, and Roland (1990). For the present purposes, only the productions corresponding to the last frame will be analyzed.

Overall results

Speakers used a variety of expressions to refer to the character depicted in the last frame (the first time it was mentioned in frame 8). In addition to indefinite and definite noun phrases, definite pronouns, and zero anaphoras, there were possessive noun phrases as in "son papa" (his/her dad), proper names like "Martine", and left dislocations, where a noun phrase is immediately followed by a resumptive pronoun as in "le N il" (the N, he) or "la N elle" (the N, she).

Figure 2 shows the number of occurrences of each kind of referential expression, by type of link, display mode, and thematic continuity (vs. discontinuity). The "other" category includes proper names, and the rare cases where the character was not mentioned at all.

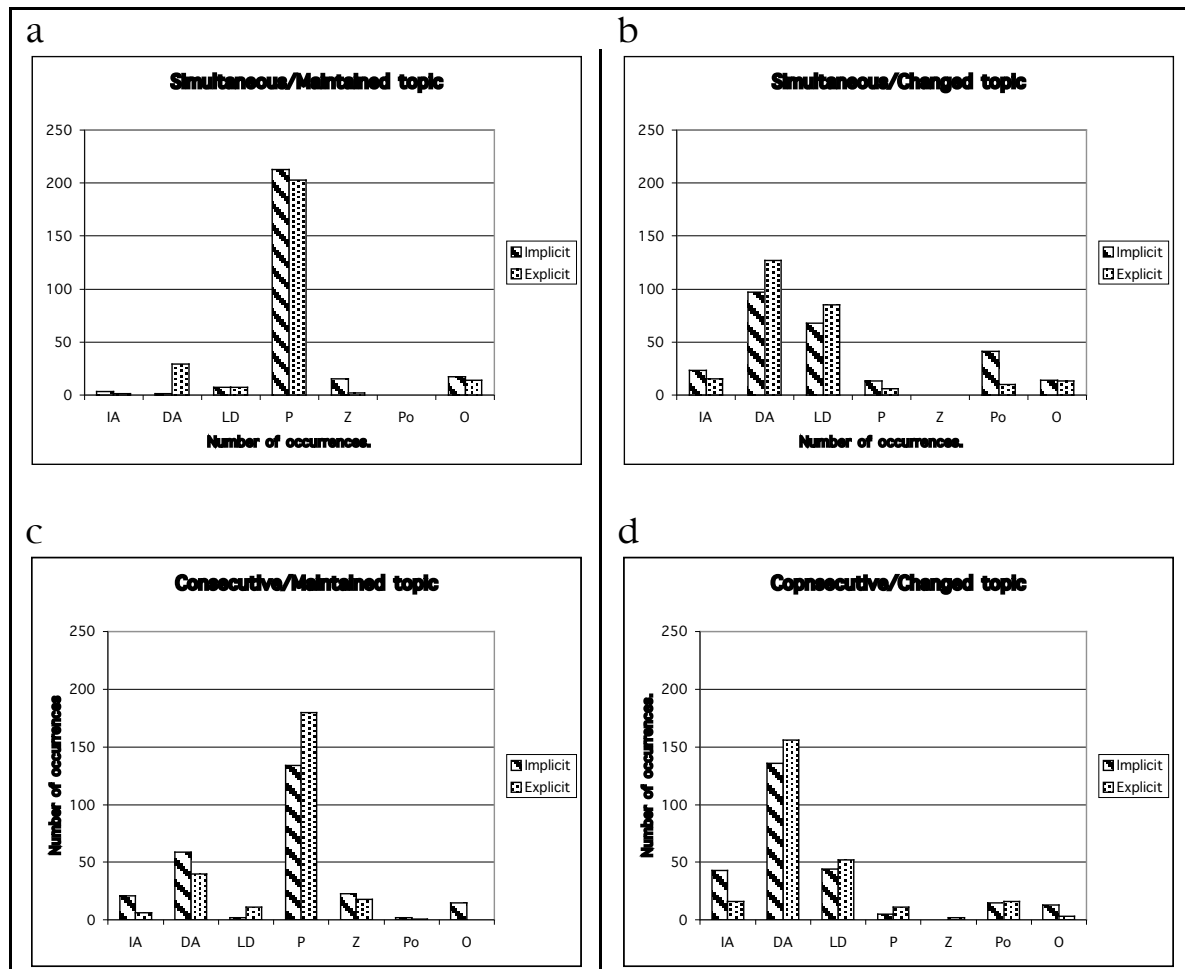


Fig. 2. Distribution of referential expressions as a function of event linkage, display mode, and topic. IA, indefinite noun phrases; DA, definite noun phrases; LD, left dislocations; P; definite pronouns; Z, zero anaphoras; Po, possessive noun phrases; O, other.

For the experiment as a whole, pronouns (37%) and definite noun phrases (32%) were the most frequent categories. The character was usually introduced as expected, namely, by a definite pronoun when the topic was maintained (Figures 2a and 2c), and by a definite noun phrase when the topic changed (Figures 2b and 2d). Left dislocation (14%) seems to have acted as a means of reintroducing an already mentioned entity, insofar as it was primarily used when the topic changed (Figures 2b and 2d). The rare cases of a zero anaphora (3%) were found essentially as expected when the topic was maintained (Figures 2a and 3c). Possessive noun phrases (4%) appeared especially when the topic changed (Figures 2b and 2d). The infrequent use of an indefinite noun phrase (6%) proves that the subjects did indeed note the existence of two characters in the first picture. Indefinite nounphrases were more frequent when the topic changed (Figures 2b and 2d).

Figure 2 also shows a sharp contrast between the two display modes. In contrast, the distributions did not vary much across the two types of linkage.

Most commonly used referential expressions

To test predictions about the factors manipulated, the number of occurrences of the most frequently used devices (pronouns, definite noun phrases, and left dislocations) were analyzed separately using an analysis of variance with the following design: 4 (Age: 7, 8, 9, adult) \times 2 (Display: simultaneous, consecutive) \times 2 (Link: implicit, explicit) \times 2 (Topic: maintained, changed) and repeated measurements on the last factor. An alpha level of .05 was used for all statistical tests.

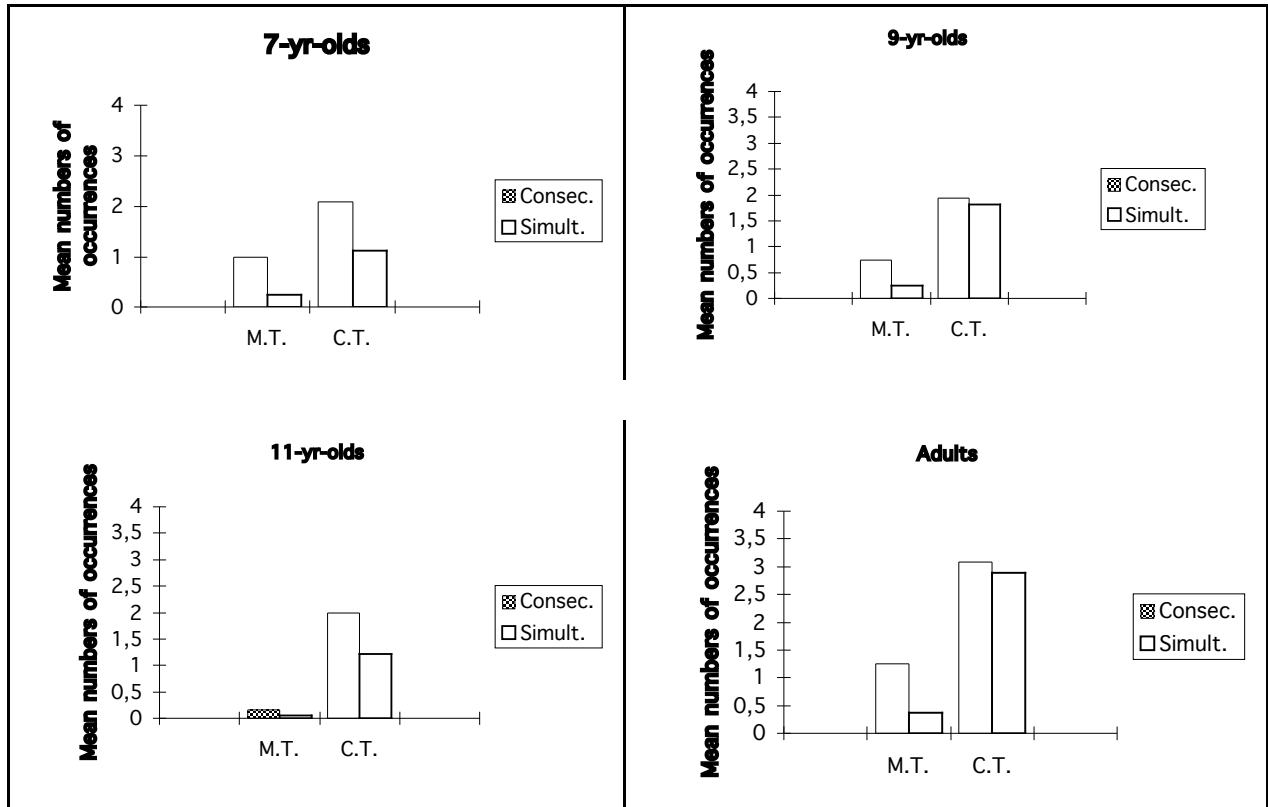
Definite noun phrases

The effect of Age was statistically significant: $F(3, 240) = 17.98$, $p < .001$. Newman-Keuls pair-wise comparisons (significant at .01) showed that the greatest overall difference was between the 11-year-olds and the adults. The 11-year-olds used the fewest definite noun phrases, whereas the adults used the most (means: 1.1 for 7-year-olds, 1.2 for 9-year-olds, 0.9 for 11-year-olds, and 1.9 for adults).

Definite noun phrases refer back to the referent. They were observed more frequently when the topic changed: $F(1, 240) = 373.11$, $p < .001$ (means: maintained 0.5 vs. changed 2.0). Moreover the magnitude of the topic-linked difference increased with age, as shown by the interaction between Age and Topic: $F(3, 240) = 10.02$, $p < .001$. Thus, this device appears to be acquired gradually as a means of reintroducing a referent mentioned earlier in the discourse.

As can be expected from Figure 2, the display mode effect was statistically significant: $F(1, 240) = 26.41$, $p < .001$. Definite nounphrases were more frequent in consecutive display (mean: 1.5) than in simultaneous display (1.0).

a



b

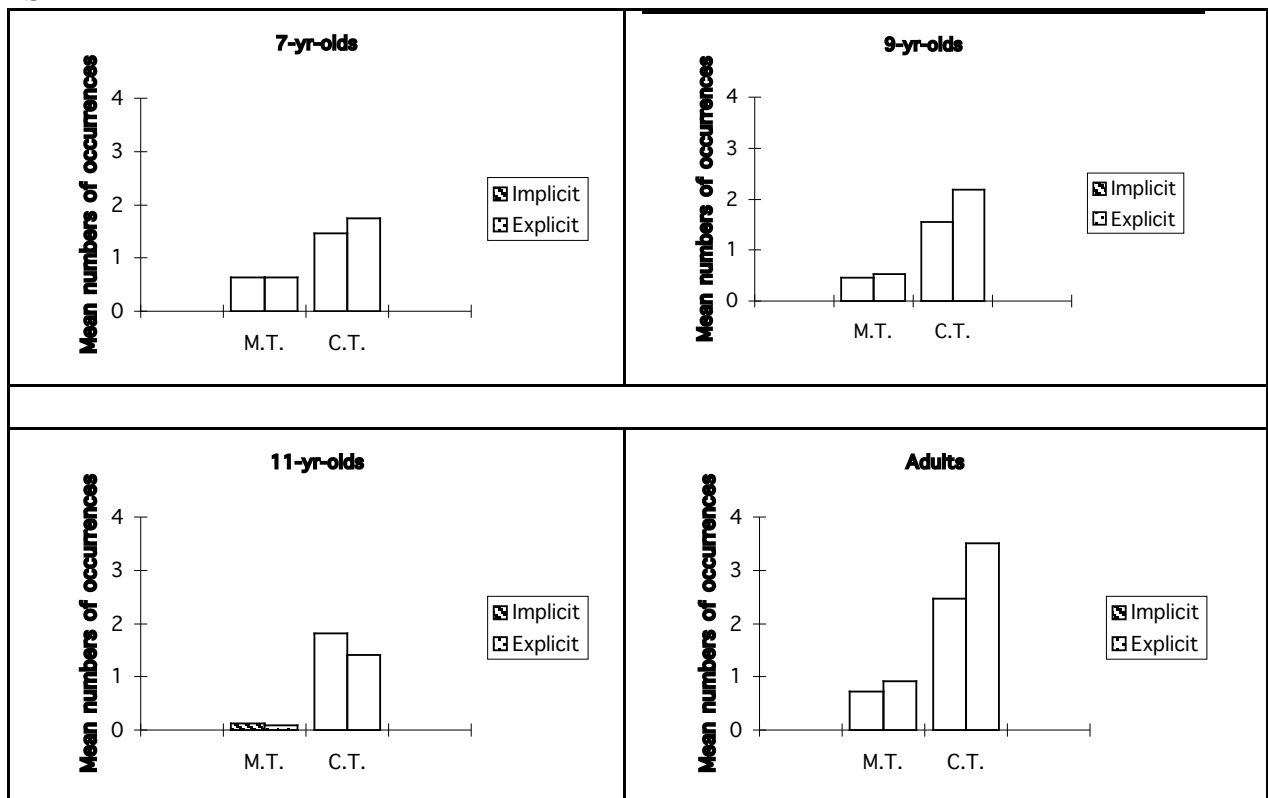


Fig. 3. Definite articles, changes with age as a function of topic and (a) display mode (means) and (b) type of links (means). M.T., maintained topic; C.T., changed topic; Consec., consecutive; Simult., simultaneous.

The interaction between Age, Topic, and Display was also statistically significant: $E(3, 240) = 3.73$, $p < .05$ (Figure 3a). At the age of 7, definite noun phrases were used more often when the comic strips were viewed picture by picture and/or when the topic changed. In contrast for 9-year-olds and adults, their occurrence when the topic changed did not vary across display modes. Finally, the 11-year-olds rarely used definite noun phrases when the topic was maintained, and when the topic changed, they used fewer definite noun phrases in simultaneous than in consecutive display.

The effect of the type of link was not statistically significant, but did interact with Age and Topic: $E(3, 240) = 2.80$, $p < .05$ (Figure 3b). For 7- and 9-year-olds, when the topic changed, they used a definite noun phrase more often when the link between the pictures was explicit. This difference also existed for the adults, for whom it was the most pronounced. The 11-year-olds did just the opposite: they tended to use fewer definite noun phrases when the link was explicit.

Pronouns

The effect of Age was statistically significant: $E(3, 240) = 3.65$, $p < .01$. Newman-Keuls pair-wise comparisons (significant at .05) showed that the number of pronouns at age 9 and age 11 did not differ significantly. Pronouns in these two age groups outnumbered those produced by the youngest and oldest subjects (means: 1.4 for 7-year-olds, 1.6 for 9-year-olds, 1.6 for 11-year-olds, and 1.3 for adults).

Pronouns mark high referent accessibility. As expected, they were used primarily when the topic did not change, and they were infrequent when it did: $E(1, 240) = 1368.80$, $p < .001$ (means: maintained 2.8 vs. changed 0.1). The 11-year-olds were the ones to use the greatest number of pronouns when the topic did not change, generating a significant interaction between Age and Topic: $E(3, 240) = 5.40$, $p < .01$.

The main effect of Display was statistically significant: $E(1, 240) = 28.44$, $p < .001$. Display mode interacted with speaker age: $E(3, 240) = 5.34$, $p < .01$, and with thematic continuity: $E(1, 240) = 30.74$, $p < .001$. The interaction between Age, Topic, and Display was also significant: $E(3, 240) = 2.93$, $p < .05$ (Figure 4).

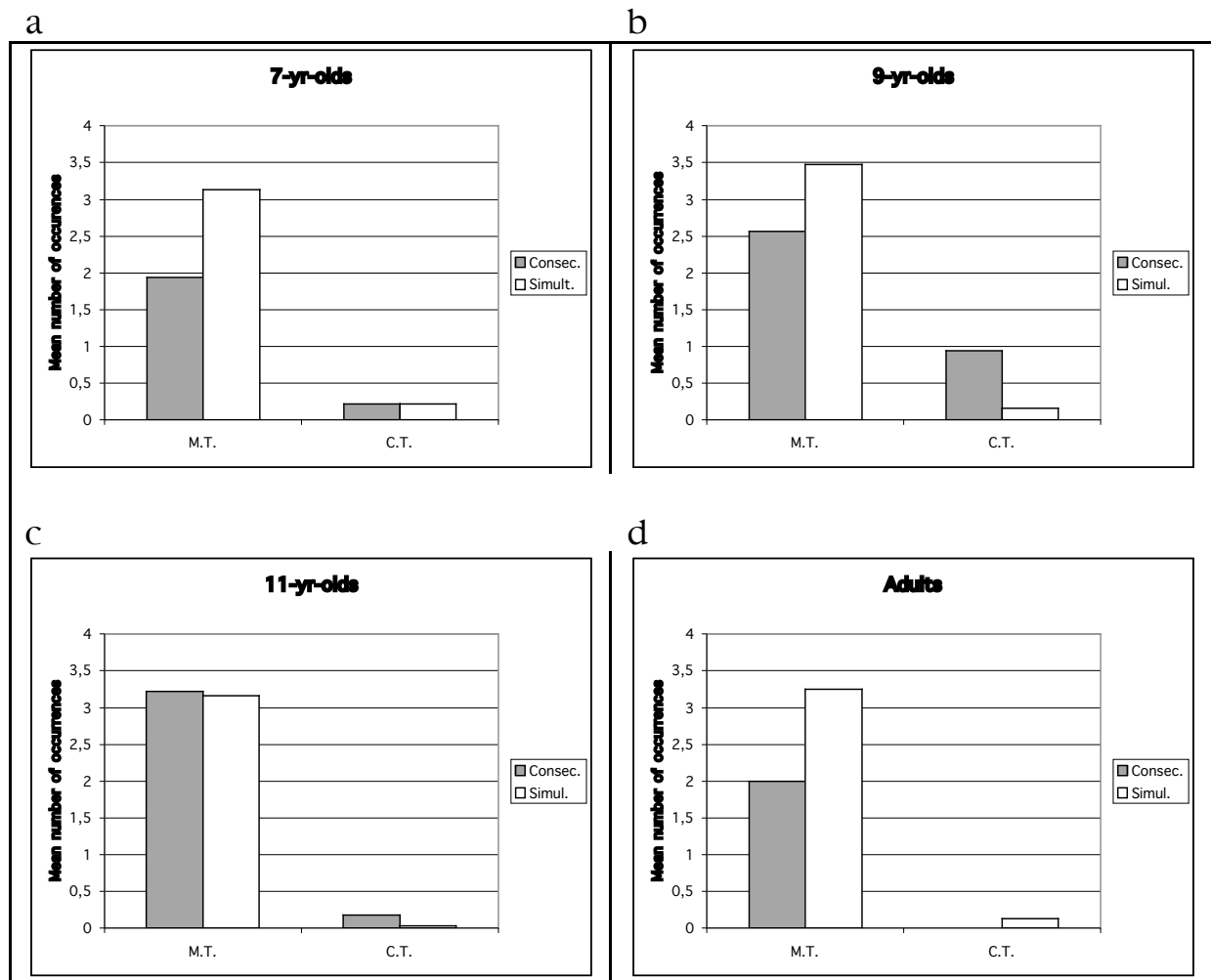


Fig. 4. Pronouns: changes with age in the interaction between topic and display mode (means). M.T., maintained topic; C.T., changed topic; Consec., consecutive; Simul., simultaneous.

The within-discourse use of pronouns seems to be solidly established at the ages considered here: the very small number of pronouns used when the topic changed declined with age (14, 8, 9, and 4 occurrences, respectively, out of 256 at each age). When the topic was maintained, the simultaneous display mode promoted the occurrence of pronouns, as expected. However, this effect did not occur at age 11, where pronoun usage depended only on thematic continuity.

The effect of the type of link was statistically significant: $E(1, 240) = 4.05$, $p < .05$. An explicit link gave rise to the predicted overall increase in pronouns (means: explicit 1.6 vs. implicit 1.4). This occurred only when the topic was maintained, generating an interaction between Topic and Link: $E(1, 240) = 4.10$, $p < .05$. Another more pronounced interaction effect was observed between Link and Display: $E(1, 240) = 12.40$, $p < .001$. An implicit link, in conjunction with picture-by-

picture display of events, led to little use of pronouns compared to the other three situations.

Left dislocation

The effect of Age was statistically significant: $E(3, 240) = 19.09$, $p < .001$. The adults practically never used left dislocation (means: 0.7 for 7-year-olds, 0.6 for 9-year-olds, 0.8 for 11-year-olds, and 0.1 for adults). This accounts for the interaction between Age and Topic: $E(3, 240) = 17.80$, $p < .001$. The adults (as noted above) preferred using definite noun phrases, which they employed in one out of two utterances in phrases like "le N du début" (the N at the beginning), etc. Left dislocation thus turned out to be a child-specific means of handling reference.

The three groups of children used left dislocation to refer back to the referent in quantitatively and qualitatively similar ways. This device was observed primarily when the topic changed, as shown in Figure 2: $E(1, 240) = 152.21$, $p < .001$ (means: maintained topic 0.1 vs. changed topic 1.0). It was used all the more when the entire comic strip was presented on one page: $E(1, 240) = 10.04$, $p < .01$ (means: consecutive 0.4 vs. simultaneous 0.6).

Other referential expressions

In cases of thematic discontinuity, two minor devices tended to be employed more often than others: indefinite noun phrases and possessive noun phrases (Figures 2b and 2d).

An indefinite noun phrase is an inappropriate expression for speaking of a referent that is not brand new. While such phrases tended to drop regularly with age in the children (5% at 7 and 9, 2% at 11), they were employed more often, relatively speaking, by adults (7%), especially when the comic strip was presented picture by picture and the link between the pictures was implicit.

A possessive noun phrase specifically reintroduces a referent. It also reinforces the cohesion of the narration (e.g. we have been talking so far about the little boy, and now we're talking about "his" father). Possessive noun phrases were more frequent when the comic strip was seen all at once and the links between the pictures were implicit (Figure 2b). The 7-year-olds used them less than the 9-year-olds (2% vs. 4%), who used them less than the 11-year-olds (6%). In contrast, they were not employed much by the adults (3%).

Discussion

The aim of the present study was to show (1) that in the oral narration of a series of events depicted in a comic strip, the choice of markers to indicate the degree of referent accessibility depends on what processes (inference making and memory encoding) are carried out on the available visual information, and (2) that manipulating these processes experimentally by controlling the availability of visual information is a means of achieving a finer assessment of speakers' referential and narrative skills. The hypothesis was that, the production context would affect reference cohesion marking regardless of the speaker's age, but that it would provide a closer look at the skills acquired at each age.

As expected, at all ages considered here, speakers primarily marked the character in the last picture as a within-discourse given. In cases of thematic continuity, the referential link was marked for the most part by means of expressions that did not explicitly mention the referent. Many definite pronouns and a few zero anaphoras were noted. In cases of thematic discontinuity, the referential link was marked with expressions which, on the contrary, explicitly mentioned the character. The range of forms observed in this case was greater than anticipated. As expected, definite noun phrases outnumbered all others, but (a few) possessive noun phrases were also found, and many left dislocations, as in "Le petit chat il grimpe à l'arbre" (The little cat, it's climbing the tree). By the age of 7, all of these forms were used, although their frequency evolved in the course of development.

The present results show that thematic continuity/discontinuity marking becomes more and more discriminating as children grow older. In cases of continuity, the greater use of pronouns with age was accompanied here by a steady decrease in the already-rare use of definite noun phrases. In case of discontinuity, explicit referral back to the character mentioned at the beginning of the story was achieved by means of a definite noun phrase (most common at age 9) or a left dislocation (most common at age 11). The use of these two forms combined was relatively stable in the children. For the less frequent forms, the gradual disappearance of indefinite noun phrases (inappropriate) was accompanied by a steady increase in the use of possessive noun phrases (appropriate). Between the ages of 7 and 11, the children thus progressed towards

marking referent status in accordance with the conventional within-discourse referencing system of French.

Regarding the constraints to which the verbalization was subjected in this study, the frame display mode had the greatest effect on children's and adults' referential choices, giving rise to the expected variations in the precision of referent accessibility marking. While on-line verbalization favored the use of definite noun phrases (appropriate for marking both thematic continuity and discontinuity), exposure to all pictures at once before verbalization led to different types of referencing in the children. Continuity was marked by pronouns, and discontinuity, by left dislocations.

Manipulating this factor thus made it possible to show that the display mode used affects performance, and must therefore be considered in attempts to account for speaker performance, especially child speakers. Manipulating display mode also made it possible to show that the constraints it imposed on display processing change with age. At age 7, linguistic marking of the character in the last frame, although mostly achieved via within-discourse markers, still seemed to be partially stimulus-driven (some cases of a deictic use of pronouns and a few indefinite articles still observed). At age 11, definite noun phrase still depended on the display mode, but pronoun use did not. The 11-year-olds used (1) the greatest number of pronouns when the topic was maintained, and (2) the smallest number of definite noun phrases. The productions of the 11-year-olds seem to have been strongly dictated by the desire to produce coherent discourse that complied with the conventional within-discourse rules for using referential markers taught in school.

The adults stood apart from the children on two points: (1) they practically never used left dislocation, and (2) they employed more definite and indefinite noun phrases (than did the children). The first discrepancy between adults and children can be explained by the strict norms governing referential processes in French writing. In written French, the physical presence of the already-written portions of a text prohibits certain kinds of redundancy, including left dislocation (Reichler-Béguelin, 1988). Adults have no doubt learned to inhibit their use of left dislocation in order to keep their oral rendition of the story in line with the rules of standard French.

An explanation for the second discrepancy between adults and children can be drawn from the assumption that development not only involves the gradual adoption of the conventional referential system, but also the gradual acquisition of textualization and narration-specific know-how and skills. Kail and Hickmann (1992) found that unlike younger French

children, 11-year-olds no longer made the definite/indefinite distinction in accordance with whether or not the knowledge being related was shared by the listener. These children systematically used indefinite forms to introduce referents rather than taking the mutual nature of the knowledge into account. Kail and Hickmann interpreted this result as an "across-the-board" type of usage reflecting their newly acquired knowledge that referential expressions are the conventional markers of cognitive status. Adults who have long known this marker can use referential expressions in a less costly manner while still being sure that the information is properly conveyed. Rather than only fitting their choice of markers to the cognitive status of the referent, the adult speakers tested here also used narration devices that the children did not employ. To maintain the topic, adult speakers referred to the last character, for example, as "le petit chat de tout à l'heure" (the little cat from before), and to change topics, they used narration-specific wording like "pendant ce temps le petit chat ..." (meanwhile, the little cat...), "alors que le petit chat ..." (while the little cat ...). This approach sometimes led them to be overly redundant (and consequently, less accurate), as testified by the presence of indefinite expressions (inappropriate). Unlike school children, adult speakers did not feel as "tied once and for all to the spatiotemporal frame of reference and to the universe of stable and invariable references that the norm tends to impose, especially on the written language" (Reichler-Béguelin, 1988, p. 205).

Type of link had a relatively small impact on performance, perhaps due to a possible lack of uniformity in link explicitness among the different character pairs in the experimental materials. However, the results showed that, in conjunction with the display mode, link explicitness contributed to generating contexts that were more or less conducive to the use of pronouns. Moreover, the results for this factor provide an additional argument in support of the interpretation proposed above for the 11-year-olds' behavior. In cases where the topic changed, whenever the link was explicit, only the 11-year-olds marked the character in the last frame using a left dislocation; all other speakers employed definite noun phrases. The use of this reintroducing device is indicative of the fact that these children have mastered all of the finer devices offered by the referential system of their language to mark cohesion.

This raises another question: Why didn't the performance observed here progress in a linear fashion with age? The observed performance patterns may be a function of how long ago the concerned skill was learned in school. In our society where children begin school at a very

young age, it is difficult to determine what actually would develop "spontaneously", i.e. with no formal teaching, if communication failures alone were responsible for development. School learning, which is based essentially on written forms, leads children to take full advantage, not only of the possibilities offered by their language's referential system, but also of other means of marking discourse cohesion. Once these devices have been learned, the actual practice of ordinary oral communication, whose usage conditions and requirements differ from those of the written language, leads to functioning at a lesser cost.

In conclusion the results obtained in this study suggest that a picture-based narration can be regarded as a conducive situation for revealing the characteristics of both children and adults. Provided the required cognitive processing is controlled, this task can be used: (1) at each age, to better understand what governs the use of reference cohesion markers, and (2) to gain insight into why certain everyday contexts are more favorable than others to the manifestation of acquired skills.

Appendix. Experimental materials

Explicit link

Test comic strips: contents of first frame

1. A man and a woman sitting on a sofa
2. An adolescent and a little boy
3. A man and an adolescent at the beach
4. A woman and a little girl at the table
5. A turtle and a crocodile at the water's edge
6. A monkey and a lion in the brush
7. A hen and chicks in the courtyard
8. A cat and a donkey in the fields

Topic of filler comic strips (one character only)

- a. A cat is playing by the sea
- b. A grandmother is shopping
- c. A man is getting up in the morning

Explicit link

Test comic strips: contents of first frame

1. A child and an old man in the living room

2. A man and a woman at home
3. A boy and a girl at the beach
4. A boy and a man fishing
5. A dog and a cat sleeping on a rug
6. An earthworm and a snail in a kitchen
7. A hedgehog and a rabbit at the roadside
8. A fish and a frog near a pond

Topic of filler comic strips (one character only)

- a. A dog is playing in a yard
- b. A boy is exploring a cave
- c. A mouse is looking for food

References

- Ariel, M. (1988). Referring and accessibility. Journal of Linguistics, 24, (1), 65-87.
- Bamberg, M. (1987). The acquisition of narratives. Learning to use language. Berlin: Mouton de Gruyter.
- Berman, R., & Slobin, D. (Eds.) (1994). Different ways of relating events in narrative: a cross-linguistic developmental study. Hillsdale, N.J.: Lawrence Erlbaum.
- Botvin, G., & Sutton-Smith, B. (1977). The development of structural complexity in children's fantasy narratives. Developmental Psychology, 13, 377-378.
- Bronckart, J.P. (1985). Pour un modèle de production du discours. In J.P. Bronckart (Ed.), Le fonctionnement des discours (pp. 3-58). Neuchâtel: Delachaux et Niestlé.
- Canoz, F., & Vion, M. (1994). Encoding and maintaining reference in oral discourse. International Journal of Psychology, 29 (5), 537-564.
- Clark, H.H., & Carlson, T.B. (1981). Context for comprehension. In J. Long & A. Baddeley (Eds.), Attention and performance IV (pp. 313-330). Hillsdale, N.J.: Lawrence Erlbaum.

- Danset-Léger, J. (1978). Pour une étude psychologique de la lecture des histoires en image par l'enfant. Journal de Psychologie, 3, 279-307.
- Deutsch, F.(1975). The effects of sex of subject and story character on preschoolers' perceptions of affective responses and intrapersonal behavior in story sequences. Developmental Psychology, 11, 112-113.
- Fine, J.(1985). Cohesion as an index of social cognitive factors: oral language of reading disabled. Discourse Processes, 1, 247-266.
- Gundel, J.K., Herberg, M., & Zacharski, R. (1993). Cognitive status and the form of referring expressions in discourse. Language, 69 (2), 274-307.
- Hickmann, M. (1984). Fonctions et contexte dans le développement du langage. In M. Deleau (Ed.), Langage et communication à l'âge préscolaire (pp. 27-58). Rennes: Presses Universitaires de Rennes.
- Hickmann, M. (1995). Discourse organization and the development of reference to person, space and time. In P. Fletcher & B. MacWhinney (Eds.), Handbook of Child Language (pp. 194-218). Oxford: Blackwell Publishers.
- Hickmann, M., Kail, M., & Roland, F. (1995). Organisation référentielle dans les récits d'enfants en fonction des contraintes contextuelles. Enfance, 2, 215-226.
- Hickmann, M., Liang, J., Hendricks, H., & Roland, F.(1990). The development of discourse cohesion: coding manual. Nijmegen: Max Planck Institute for Psycholinguistics.
- Kail, M., & Hickmann, M.(1992). French children's ability to introduce referents in narratives as a function of mutual knowledge. First Language, 12, 73-94.
- Karmiloff-Smith, A. (1981). The grammatical marking of thematic structure in the development of language production. In W. Deutch (Ed.), The child's construction of language (pp. 121-147). London: Academic Press.

- Karmiloff-Smith, A. (1985). Language and cognitive processes from a developmental perspective, Language and Cognitive Processes, 11, 61-85.
- Light, L. Capps, J., Singh, A., & Alberton-Owens, S. (1994). Comprehension and use of anaphoric devices in young and older adults. Discourse Processes, 18, 77-103.
- LLoyd, P. Camaioni, L., & Ercolani, A.P.(1995). Assessing referential communication skills in the primary school years: a comparative study. British Journal of Development Psychology, 13, 13-29.
- McGann, W., & Schwartz, A. (1988). Main character in children's narratives. Linguistics, 26, 215-233.
- Norris, J.A., Brining, R.H.(1988). Cohesion in the narratives of good and poor readers. Journal of Speech and Hearing Disorders, 53, 416-424.
- Orsolini, M. Rossi, F, & Pontecorvo, C.(1996). Re-introduction of referents in italian children's narratives. Journal of Child Language, 23, 465-486.
- Peterson, C.(1993) Identifying referents and linking sentences cohesively in narration. Discourse Processes, 16, 507-524.
- Reichler-Béguelin, M.J.(1988). Norme et textualité. In G. Shoeni, J.P. Bronckart, & P. Perrenoud (Eds.). La langue française est-elle gouvernable? Normes et activités langagières (pp. 185-216). Neuchâtel: Delachaux et Niestlé.
- Ricard, R., & Snow, C.(1990). Language use in and out of context. Journal of Applied Developmental Psychology, 11, 251-266.
- Roth, F.P., Spekman, N.J., & Fye, E.C.(1995). Reference cohesion in the oral narratives of students with learning disabilities and normally achieving students. Learning Disability Quarterly, 18, 25-39.
- Roth, F.P.,& Spekman, N.J.(1989). Narrative discourse proficiency of learning disabled students; differences between elicitation procedures. Symposium for Research on Child Language Disorders, Madison, WI.

- Sauvaire, V., & Vion, M. (1989). Expression of the given-new contrast in referential communication: a study of seven and nine year-old children. European Bulletin of Cognitive Psychology, 9, 431-449.
- Schwartz, D. (1995). Reasoning about the referent of a picture versus reasoning about the picture as the referent: an effect of visual realism. Memory and Cognition, 23, 709-722.
- Trabasso, T., & Rodkin, P. (1994). Knowledge of goals/plans: A conceptual basis for narrating "Frog where are you?". In R. Bernan & D. Slobin (Eds.), Different ways for relating events in narrative: A cross-linguistic developmental study (pp. 85-106). Hillsdale, NJ.: Lawrence Erlbaum.
- Trabasso, T., & Nickels, M. (1992). The development of goals and plans of action in the narration of picture stories. Discourse Processes, 15, 249-275.
- Trabasso, T., Stein, N., Rodkin, P., Munger, M., & Baughn, C. (1992). Knowledge of goals and plans in the on-line narration of events. Cognitive Development, 7, 133-190.
- Vion, M. (1995). Quel contexte pour le traitement du discours? L'Année Psychologique, 95, 131-164.
- Vion, M., & Colas, A. (1998). L'introduction des référents dans le discours en Français: contraintes cognitives et développement des compétences narratives. L'Année Psychologique, (98), 37-59.
- Vonk, W., Hustinx, L., & Simons, W. (1992). The use of referential expressions in structuring discourse, Language and Cognitive Processes, 7, 301-333.